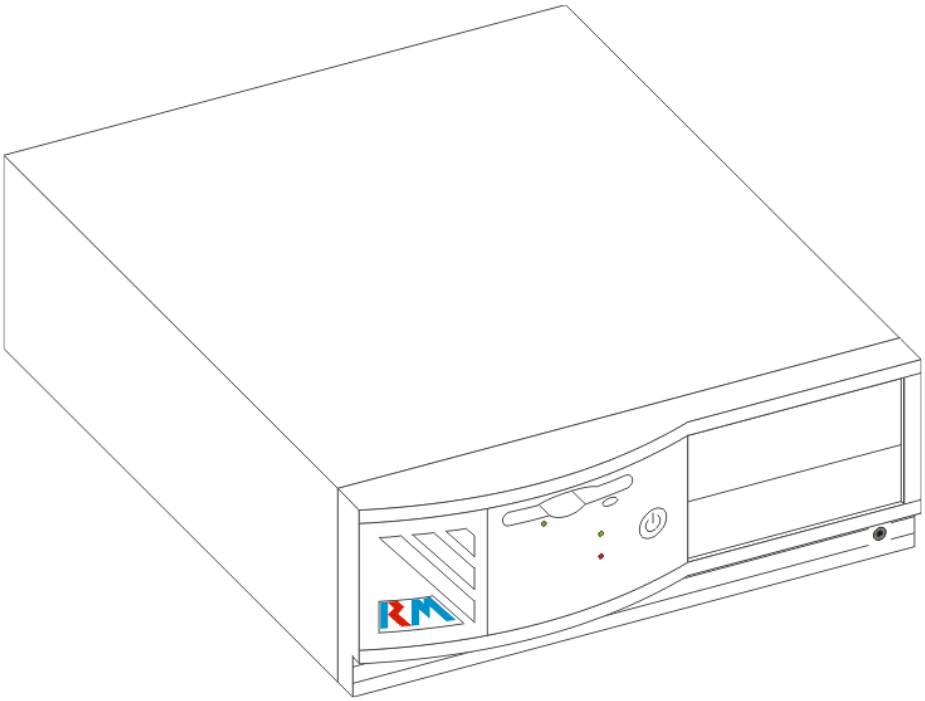
C-Series User Manual



Computer Details

Fill in the details of your computer for quick reference:

Model Description (see front of computer):		.....
Part Number (see rear of computer):		.....
Serial Number (see rear of computer):WO/TO/MO		.....……..…....
Customer Account Number (see despatch note):		.....
Graphics:		.....
Floppy disk drive:		
Hard disk Configuration:	Disk1:	.....MB
Network Configuration:		.....
Options:		
DIMMs:	Size:	.....MB
	Size:	.....MB
CD ROM:	Speed:	……..
Other:	Details:	.....
		.....
		.....
		.....

C-Series User Manual
Edition 1

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Because our policy is to improve our products and services continually, we may make changes without notice. We have tried to keep the information in this manual completely accurate, but we cannot be held responsible for the consequences of any errors or omissions.

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Introduction

Welcome to the C-Series User Manual. This manual provides you with most of the information you need to use your C-Series computer.

This manual includes:

- familiarising yourself with your computer including monitor, disk drives, memory, printers and other equipment
- upgrading your computer by fitting extra options
- troubleshooting, if things go wrong
- technical information about your computer
- glossary, which explains all the technical terms used in this manual.

We do not expect you to read every chapter in this manual before you start using your computer. However, we suggest you read through this introduction, Chapter 1:- Getting Started and Chapter 2:-System Description.

Important:
Read the Safety section (on pages 2 through 5) before you start using your computer.

Refer to this manual whenever you need further information on how to operate your computer.

™

This Windows icon is the ‘RM PC Help’ icon which loads the RM PC help file. This file is pre-installed on all C-Series computers with a hard disk drive fitted as standard and provides help on setting up and optimising the performance of your computer. Wherever you see this icon in this manual it indicates that there is additional help or more detailed information available in the Help file. The RM PC Help file also includes updates covering new features or improvements that may not yet be incorporated into this manual.

Safety

Please read the information on this and the following pages. It is important for your safety.

WARNING:
Electricity is dangerous - it is vital to earth all mains-powered equipment that is designed to be earthed. This includes the computer and any peripheral devices you may be using. Even if a piece of equipment operates correctly, this is no guarantee of electrical safety. If in any doubt, consult a qualified electrician.

Hazardous voltages are exposed if the cover of the computer is removed.

This computer is designed to meet the EN60950 safety standard which apply's to information technology equipment, including electrical business equipment.

CE On the 1st January 1996 the new Electromagnetic Compatibility Directive (89/336/EEC) became a legal requirement on all electrical and electronic equipment. RM products comply fully with this European Directive.

The relevant standards are EN50082-1 and EN55022 and these refer to:

- Protection from spurious mains power interference
- Immunity from external radio frequency interference
- Safeguards against static discharges (ESD)
- Reduced radio frequency emission from PCs

Plugs and Sockets

The mains cable provided with your computer comes with a sealed moulded plug so no wiring is required.

Always use the mains cable plug provided, inserted into a standard 3-pin power socket only. Sockets should be earthed through the wiring system of the building and must be easily accessible.

Cables

Check the condition of all cables - and particularly mains cables - regularly. If any are damaged, replace them immediately.

Place the computer near to the socket to avoid trailing cables.

If you use an extension lead, make sure it is three-core and safely earthed. **Incorrect wiring can be fatal**.

Fuses

Always use a 5A fuse that conforms with BS1362 and is approved by ASTA for your C-Series computer. Always keep the fuse cover on.

WARNING:
Never replace a blown fuse with one of a higher rating than the correct fuse.

Ventilation and Dust Protection

Your C-Series computer has a cooling fan outlet on the rear panel and ventilation slots on the underside of the front panel. Always make sure that all the ventilation outlets are not obstructed, to prevent your computer from overheating.

Unused expansion slots and unused disk drive bays should always be covered with the supplied blanking plates. This will ensure the correct airflow inside your computer and keep dust out. Keeping the blanking plates in place will also prevent electromagnetic interference occurring between your computer and other equipment.

Note that, while hard disk drives are sealed against dust, floppy disk and CD-ROM drives cannot be protected in the same way and they may be damaged if you keep your computer in an area which is very dusty.

Other Precautions

WARNING:
Before adding or removing any adapter card or peripheral, be sure to turn the computer off and disconnect it from the mains supply. Failure to do so could cause serious damage to the computer and associated components, and may cause injury to yourself or others.

Warranty claims made for defects arising from failure to comply with this instruction will not be entertained by RM or their suppliers of third party components.

- Do not tamper with the power supply unit.
- Do not move the computer while it is switched on. If you want to move the computer, always switch it off and wait for a minute to allow the hard disk(s) to stop rotating.
- Keep the computer cover screwed on when in use. Always replace the cover when you have finished working within the computer and before you switch it back on.

Conventions Used in this Manual

Throughout this manual, the following conventions are used:

`<Enter>`	Press the appropriate key on the keyboard (see page 29). In this example, you should press the <Enter> key (↵).
`<Alt/S>`	Slashes separate keys. In this example, press the <Alt> key and hold it down as you press <S>. Release both keys together.
<→> <←> <↑> <↓>	These are the right, left, up and down arrow keys. These keys are on the right of your keyboard.

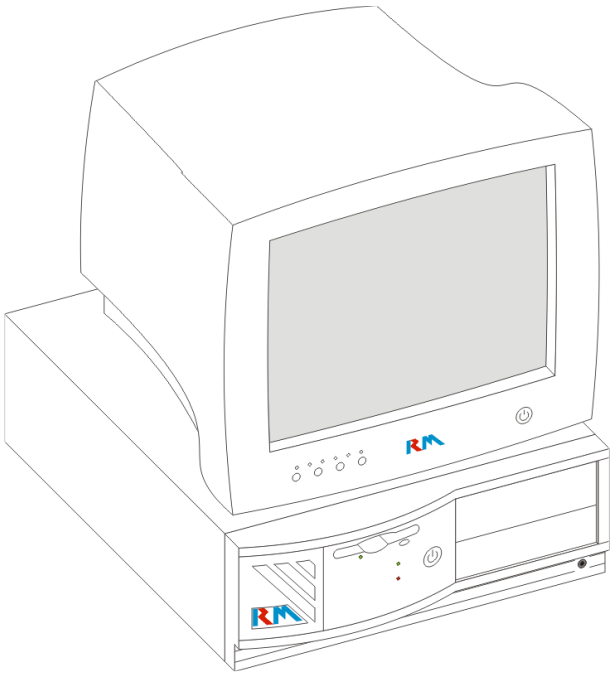
Courier type face is used to indicate screen messages and command lines, for example: `Press Enter to continue`.

Chapter 1
Getting Started

This chapter outlines the steps to follow and the jobs you need to complete before you can really start to use the computer for work.

1. Before you start.
2. Disks and manuals.
3. Setting up your computer taking into account security and the environment.

RM also runs various training courses. Contact the RM Training Administrator on Abingdon (01235) 826125 for details.



Before you Start

- Serial Number

  The serial number label can be found on the rear panel of the computer's case. The serial number is of the form of either **TO**123456 / 78, **WO**123456/78 or **MO**123456/78. It is important to make a note of the serial as this is your security number recorded on all expensive components inside your computer.

- Part Number

  The part number can be found from the label on the rear panel of the computer's case. The part number is of the form 12345. Together with the Serial Number, this number uniquely identifies every machine.

- Customer Account Number

  The despatch note has your customer account number printed on it. You will need this number if you ever need to call RM. Make a note of the number on the inside front cover of this manual (or another suitable place).

- Licence Agreements

  Make sure all licence agreements are kept in a safe place as they may be required if you wish to re-install or upgrade the software on your computer. These may also be required if you need to demonstrate you are using correctly licensed software.

Disks and Manuals

- **Making backups**

  Always use copies of master disks rather than using the originals. If you damage the copy you can make a new copy from the original. Also make copies of important files. If you then delete files accidentally, or your computer fails, you will have a copy which you can use.

- **Operating system manuals**

  They explain how to use the operating system software (e.g. Windows® NT or Windows® 95) supplied with your computer. Master disks or CDs may be supplied depending on the model.

- **On-line documentation**

If a hard disk drive is fitted, RM provide an on-line help file on the Windows desktop.

The operating system software has its own on-line help files and any additional software such as Microsoft® Office Professional also has its own on-line tutorial help.

- **Network documentation**

  If your computer is being used as a network station, the accompanying network documentation tells you how to use your computer as part of a network.

- **Technical manuals**

  Apart from this user manual your computer is supplied with a software copy of the *System Board User's Manual*.

Setting up the Computer

Things to consider before you start:-

Security Considerations

Theft of computers or components is becoming more common so RM recommend you implement all secure practices.

Security products are available, e.g. security cable and padlock; for information on the full range please call the Education Sales Desk on (01235) 826868. Our sales advisors will be happy to discuss any aspect of PC security with you. There are products to suit any security need and budget; many are available on a next-day delivery via RM Direct !

Access

To restrict access to the computer, place it in a room where you can control who uses it. If the computer is being used as a server on a network then locking the computer in a separate room is a practical solution as long as there is adequate ventilation.

Passwords

Your computer has a password feature, which allows you to guard against unauthorised access. This feature is set to ‘setup’ as default with a password already installed. We advise you change the password from the default as soon as possible. Keep a note of the password in a safe place. See ‘Technical Information’ page 80 for information on using the CMOS setup program to change passwords.

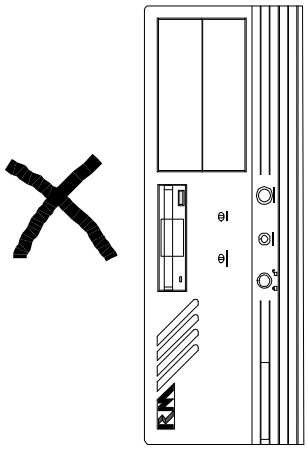
Environment Considerations

Power Supply

Place the computer near to a power point to avoid trailing cables. If you do use an extension lead make sure it is three-core and safely earthed.

Avoid connecting the computer to a power supply that is shared with heavy-duty equipment (such as hydraulic lifts, vacuum cleaners and lathes) or portable tools. This sometimes causes irregularities in the power supply.

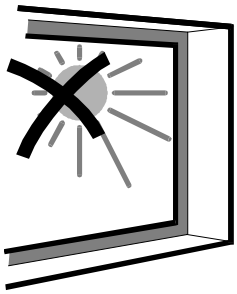
Surface



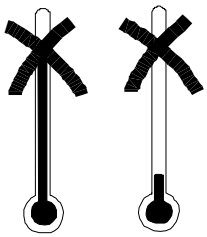
Operate your computer only if it is securely placed on its base, on a flat surface. Do not use it on its side or upside down.

Temperature

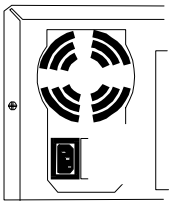
Avoid placing your computer in an environment that is damp or dusty as this will shorten the working life of the computer.



Do not place the computer where it will have prolonged exposure to direct sunlight.

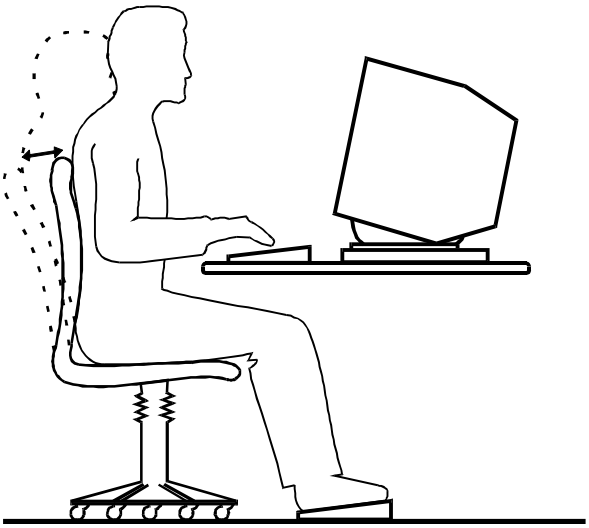


Avoid extremes of temperature (below 5°C and above 35°C). If you move your computer from a cold place into a warm room, allow some time for it to warm up before you switch it on so that it is at the correct operating temperature.



Always make sure that all ventilation outlets are not obstructed, to prevent overheating. Do not place your computer where warm air might blow into the ventilation outlets.

Looking after Yourself



- Make sure that you have enough space for all your paperwork and manuals. A document holder may help to avoid awkward neck movements.
- Adjust your chair and monitor so that you find the most comfortable position.
- Check that there are no reflections from windows or bright lights; if this is unavoidable, adjust curtains and blinds or buy an anti-glare cover for your monitor.
- Make sure you have enough space underneath your desk to move your legs freely. Try to avoid excessive pressure on the backs of your legs and knees. A footrest may be helpful.
- The angle of your keyboard can be adjusted to suit your preference and a space in front is helpful for resting your hands and wrists while typing.
- Don’t sit for long periods in the same position, change your posture as often as practicable. Short breaks away from the computer will help.

Starting Up

Unpack your computer carefully and save all the packaging in case you need to move the computer at a later date.

If you place a monitor on top of your computer, put it down gently. Place it centrally if you can. Do not put anything weighing more than 60 Kg (9 stone) on top.

Connect up your monitor, keyboard and mouse as shown on the “Setting Up Your New Computer” card.

Switch on the monitor first before switching on the computer. The power LED on the front of the computer will light when the computer is switched on.

Wait for a few moments while the computer starts up then depending on the model, your computer will boot either from the hard disk or network (if connected). Some models are supplied with a Boot Disk which can be used if required.

Chapter 2
System Description

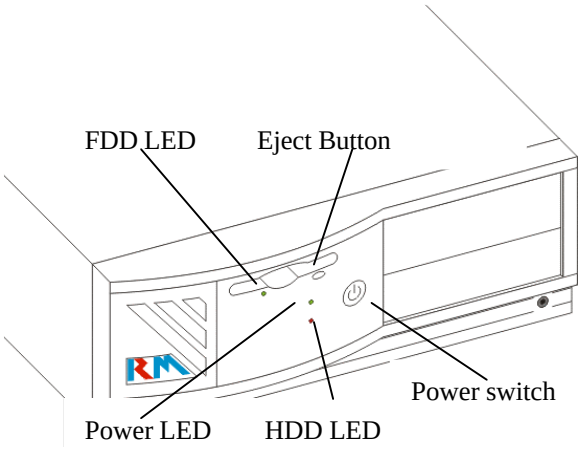
This chapter describes various aspects of your C-Series computer. It covers:

- the exterior of the computer
- using floppy disks
- using hard disk and CD-ROM drives
- the keyboard and special keys
- the mouse
- the monitor
- using printers
- connecting to a network

Variations between Models

Your computer may not look exactly like the model shown overleaf. For example, it may not have a CD-ROM drive fitted or it may also be fitted with another option in one of the spare drive bays.

The Front of the Computer



Power switch

The power switch is used to switch the computer on and off. If you switch off the computer using the power switch, wait about five seconds before switching on again.

Caution:
Think before you press the power switch. Restarting your computer means you lose all un-saved work. If possible, save your work and quit from any applications which you are running.

Power LED (POWER)

This LED (light emitting diode) is lit to indicate that the computer is switched on and the power supply is operational.

Hard disk drive LED (HDD)

This is lit when the computer is accessing the hard disk or a device attached to the hard disk interface.

3½ inch floppy disk drive

The floppy disk drive fitted in the computer uses standard 3½inch disks. To insert a disk, push it into the shuttered slot until it clicks into place.

Floppy disk drive LED

This is lit when the computer is accessing the disk in the floppy disk drive.

Disk eject button

To eject a disk, simply press the disk eject button. Do not eject a disk if the floppy disk drive LED is lit, since the computer is reading from or writing to the disk.

CDROM drive

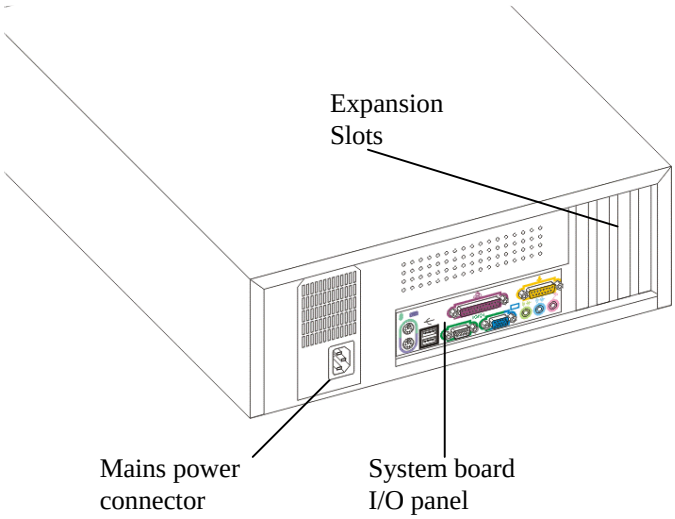
The CDROM drive fitted into the computer uses standard Compact Disks, or CD's. To insert or remove a CD from the drive, press the eject button so that the tray slides open. Press the button again to close the tray.

CDROM drive LED

This is lit when the computer is accessing the CD in the CDROM drive.

The Rear of the Computer

These features can be identified at the rear of the computer:



Note:
Not all connectors are shown here. I/O connectors may appear in any position in the I/O panel and additional connectors may appear in any of the expansion slots according to the model.

Refer to page 76 for further details about the rear panel connectors.

Fan

The grill on the rear panel is the outlet for the cooling fan.

Caution:
Do not obstruct the PSU outlet, or this may lead to overheating.

Mains power connector

An AC power supply is used to power the computer. The power cable plugs into this socket. Make sure the plug is fitted into the socket firmly and the cables are routed where they cannot be accidentally dislodged.

Serial number

Make sure that you record the serial number onto the inside front cover of this manual for security purposes. The serial number also identifies your computer model. If you contact RM, you may be asked for this number.

Voltage specification label

IMPORTANT:
The input voltage selection switch is concealed behind a label to prevent accidental tampering with the input voltage.

The computer is pre-set to 220/240V, the setting for the United Kingdom.

If you attempt to operate your computer with this switch set incorrectly or you move the switch to the other setting during use, you will seriously damage your computer. If you do not use the computer for a while, check the position of the mains input voltage switch before connecting the mains supply.

Expansion slots

Adapter cards can be fitted into your computer using expansion slots.

Monitor signal connector

The blue graphics connector is either in an expansion slot or in the system I/O panel. This connector is a D-type 15-pin socket for connection to industry-standard analogue VGA and Super VGA monitors. See page 76 for diagram of this connector.

Some models have additional adapter card(s) fitted as standard which will occupy one or more of the expansion slots (for example an Ethernet card).

I/O connectors

The mouse, serial, parallel and keyboard connectors are fitted to I/O connector positions. These connectors are labelled. See page 76 for diagrams of these connectors.

Mouse connector

This is a 6-pin IBM PS/2 connector for use with a PS/2 style mouse.

Serial connector

This is a standard 9-pin, D-type serial connector. Use this connector to connect to a serial device such as an external modem or a serial printer. The device name of this interface is COM1. If there are two serial ports then the other device name is COM2.

Parallel connector

This connector is mainly used to connect your computer to a parallel printer. The connector is a 25-pin D-type connector and its device name is LPT1.

Any additional parallel ports which have been fitted to your machine will be identified by their device names; e.g. LPT2.

Keyboard connector

This is a 6-pin socket used to connect a standard IBM PS/2 style keyboard to the computer.

Using Disks and Disk Drives

A disk is a magnetic storage device which holds information such as computer programs and data.

The computer uses disk drives to write information to a disk and to read information from the disk. There are three types of disk drives: hard disk drives (HDD), floppy disk drives (FDD) and compact disk drives (CD-ROM drives). An LED is lit while the computer is reading information from or writing to a disk.

Hard Disks

A hard disk is a non-removable disk which is built into the system. You can write to and read information from a hard disk much faster than from a floppy disk. A hard disk can also store larger amounts of information than a floppy disk.

Hard disks cannot be seen from the outside of the computer. If you have a standalone computer (i.e. the computer is not connected to a network), you can find out whether or not your computer has a hard disk as follows: switch on the computer without a floppy disk in drive A, if the operating system loads automatically the computer is fitted with a hard disk.

Backing up a hard disk

We advise you to make regular copies of all the programs and data on your hard disk using either floppy disks or tape. Tapes provide a fast, non-disruptive and secure method of archiving and restoring data.

Backing up your hard disk ensures that you always have a copy of the information held on the disk should you subsequently experience problems with it.

There is additional help on backing up in RM PC Help.

Caring for your hard disk

Take care of your hard disk. It is fragile and may be damaged if accidentally knocked or jolted. It is particularly vulnerable to damage from the following sources:

- vibration
- static electricity
- sudden changes in temperature

A hard disk is expensive to replace and data can be lost if the disk is damaged. For precautions on static, see page 45.

The heads of the hard disk in your computer are self-parking. However, remember that you must switch off the computer and allow the hard disk to stop rotating before moving the computer or adjusting its position on the desk.

Floppy Disks

A 3½inch floppy disk can be inserted into and removed from your computer.

The floppy disk drive fitted in your computer is a 1.44 MB 3½inch disk drive.
The 1.44 MB 3½inch drive accepts two types of 3½inch disks:

- 1.44 MB floppy disks, which are known as high-density disks.
- 720 KB floppy disks, known as low-density (or double-density) disks.

High-density disks can hold approximately twice as much data as low-density disks and are also more reliable. We advise you to use high-density disks wherever possible, rather than low-density disks.

Removing floppy disks

Press the disk eject button at the front of the disk drive. The floppy disk pops out halfway - enough for you to take hold of it and pull it out of the drive.

Note:
You should remove floppy disks only when the floppy disk drive light is off.

Looking after floppy disks

Look after your floppy disks to avoid them becoming damaged.
Keep disks:

- away from magnetic fields
- clean and dry
- away from sources of heat and direct sunlight

Backing up floppy disks

Always make backups (copies) of programs and data which are important to you. Store the backup in a safe place.

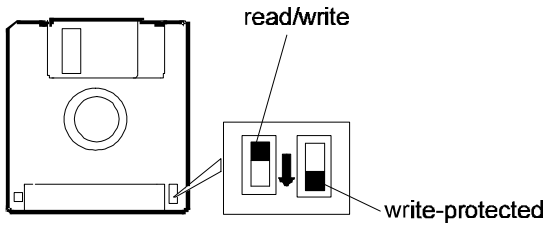
There is additional help on backing up in RM PC Help.

Labelling floppy disks

Always label your disks carefully so that you know which files they contain. Place the label on the front of the disk and make sure that the label does not touch any metal areas on the disk.

Write-protecting floppy disks

Write-protecting a floppy disk allows you to read the files on it but not to change files, delete files or add new files to the disk. To write-protect a 3.5 inch floppy disk, turn it over and slide the plastic square as shown below.



Later, if you want to write to the disk, you can slide the plastic square back to the read/write position.

Preparing new floppy disks for use

New disks must be prepared for storing information. To do this, you run a program which *formats* the disk so that the operating system can store and find information on it.

Beware:
Formatting a disk destroys any information held on the disk

Be very careful when you format a disk. You may be able to recover data lost when formatting a disk, but you should not rely on this. If you want to format a disk which you have used before, check that you no longer need the files stored on it.

To format a disk in Windows follow these simple steps:

1. Place the floppy disk you want to format into the floppy drive. Ensure the write protect tab is not set.
2. Select the My Computer icon on the Windows desktop.
3. Place the pointer on the floppy drive icon and press the right mouse button for the drop down menu.
4. Select **Format…** from the list.
5. Now follow the instructions given on the screen.

CD-ROM Drives

A CD-ROM drive is used for reading compact disks (CD's). It will be built into the spare drive bays. CDs are used as mass storage devices because you can store huge amounts of data on them.

Looking after your CDs

We advise you try to keep the CDs in their original packaging. You should try to protect the surface of the disk from scratches, fingerprints, dust particles and smears. Never put the CD down on a hard surface as this can easily mark the CD's surface. Handling the disk should be done using either the outer edge or the centre hole.

Avoid leaving CDs in direct sunlight as this can warp or deform them. Extremely humid conditions and sudden changes in temperature should also be avoided if possible.

If the surface of the CD gets dirty, use a soft, dry cloth to clean it. You can buy a special liquid to help clean the surface of the CD, available from most good record shops.

If you want to label a CD mark the labelled side with a soft felt-tip pen. NEVER use a hard or ball-point pen as this may damage the CD's surface.

Caring for your CD-ROM drive

Take care of your CD-ROM drive. It is expensive and fragile and may be damaged if the computer is accidentally knocked or jolted.

Caution:
Never use excessive force when pushing in the CD-ROM tray.

The CD-ROM drive is particularly vulnerable to the following sources of damage:

- shock
- vibration
- static electricity
- sudden changes in temperature

The Keyboard

The keyboard is used to type instructions and enter information into the computer. The keyboard supplied with your system is a Windows 95 105-key keyboard (see page 79 for pin-out of connector).

You can adjust the keyboard to two different working positions using the fold-away legs on the underside of the keyboard.

The Keys

The keys on the keyboard are grouped together into four main areas:

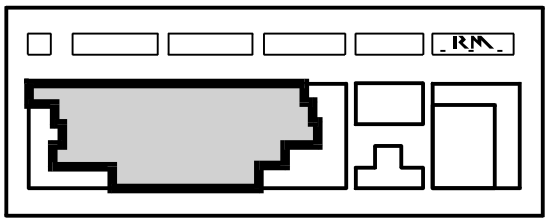
- typewriter-like keys
- function keys
- numeric keypad
- special keypads

The following sections outline the most common key actions. The action of any of the keys can be changed by the program you are running. For example, most programs use the alphabetic keys to produce letters. Some games programs use alphabetic keys for other purposes, such as controlling the movements and actions of objects on the screen.

The three lights on the right-hand side show the status of the <Num Lock>, <Caps Lock> and <Scroll Lock> keys. See later for more information on these keys.

Typewriter-like Keys

The layout of the typewriter-like keys is similar to that of a standard typewriter, as shown below:

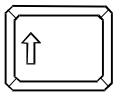


The normal actions of these keys are similar to those on a typewriter: when you press an alphabetic key, the lower-case letter appears. Non-alphabetic keys give the lower of the two characters inscribed on the key. For most of the keys, you can repeat a character by holding down the key.

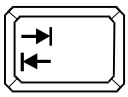
The cursor is the marker on the screen which indicates where the next letter or character will appear when you press a key.

Special keys

The following keys carry out particular functions. In many cases, the function depends on the program you are running.



To type upper-case letters (on alphabet keys) and the upper row of characters (on non-alphabet keys), press <Shift> and hold it down while you press the key you require. For example, pressing <Shift> and holding it while you press <A> gives a capital A.

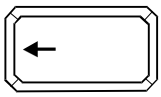


The <Tab> key moves the cursor to the right to the next tab stop. When used with <Shift>, <Tab> moves the cursor to the previous tab stop (in some applications). The tab stop positions are defined by the program you are running.

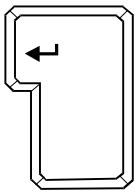
Press <Caps Lock> if you want the alphabetic keys to produce upper-case letters. The Caps Lock indicator LED lights to show that <Caps Lock> has been pressed. Using <Caps Lock> has no effect on non-alphabetic keys.

To return the alphabetic keys to lower-case mode, press <Caps Lock> again. The Caps Lock indicator LED goes out.

When the Caps Lock LED is on, use the <Shift> key to type a lower-case letter.



The <Backspace> key moves the cursor back one position to the left and erases the letter, character, tab or space in that position.



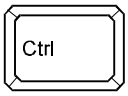
The <Enter> key is similar to the carriage return key on a typewriter. It moves the cursor to the start of the next line on the screen.

The <Enter> key is also used to instruct the computer to carry out commands.

Additional special keys

The following keys cannot be found on a typewriter, but are located in the main part of the keyboard. These keys also carry out special functions, depending on the program you are running.

The <Alt> (Alternate) key is used in conjunction with other keys. For examples of other functions, see page 34.



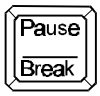
The <Ctrl> (Control) key is also used in conjunction with other keys to perform a particular function. For examples of these functions, see page 34.

The <Esc> (Escape) key can often be used to cancel a function or command, depending on the program you are running.

The <Print Scrn> key can be used in certain circumstances to print the screen display, if the computer is connected to a printer.

Pressing the <Scroll Lock> key causes the <↑> and <↓> arrow keys to move the text displayed on screen up or down one line. The cursor does not move from the line it is positioned on until <Scroll Lock> is pressed again. This key is only effective when using certain types of applications, e.g. terminal emulation software.

The Scroll Lock LED is lit to show that <Scroll Lock> has been pressed.

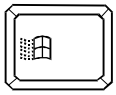


The <Pause> key stops the contents of the screen scrolling, depending on the program you are running. Press any other key to restart scrolling.

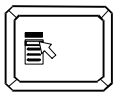
If the <Num Lock> key is pressed, the keys on the numeric keypad (see later) produce numbers rather than move the cursor.

Windows 95 keys

These keys are located in the main part of the keyboard. These keys only carry out special functions while running Windows 95.



If the <Start Menu> key is pressed, the Start Menu will be opened.



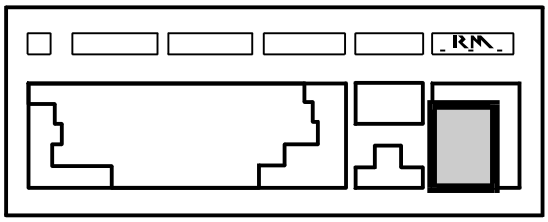
Pressing the <Right Click> key is the equivalent of pressing the right-hand mouse button. (The right hand mouse button is used a lot more in Windows 95 than older versions of Windows).

Function Keys

The function keys (F1 to F12) are located along the top of the keyboard.

These keys are used to carry out particular functions, or tasks. The function depends on the software you are running.

Numeric Keypad



The numeric keypad is located to the right of the main keyboard as shown above.

These keys can be used as either cursor movement keys or number keys. When <Num Lock> is pressed, these keys produce numbers and the Num Lock indicator LED is lit. If you press <Num Lock> again, the Num Lock LED goes off and the keys can be used to move the cursor.

Pressing the <Shift> key temporarily inverts the key operation.

As number keys

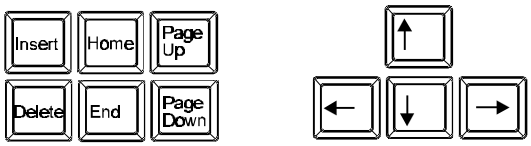
The layout of these keys is useful for entering numeric data. The add (+), subtract (-), division (/) and multiply (*) keys are on the same keypad, with an <Enter> key.

As cursor movement keys

These keys move the cursor when you run applications, use text editors and enter commands. The function of the key depends on the program you are using.

Special Keypads

The keyboard has separate cursor movement keys to the left of the numeric keypad.



These keys can be used to move the cursor even when the numeric keypad is set to produce numbers.

Key Combinations

The <Ctrl> and <Alt> keys can be used in combination with other keys to carry out particular functions. These functions depend on the program you are using.

Remember you must press down the first key and keep it pressed down while you press the second key. Where you need to press three keys, you should press the first key, hold it down and press the second key, and holding down both keys, press the third key. Release all keys together.

The following combination can be used while running Windows to end a task or close down the system.

<Ctrl/Alt/Del>

The Mouse

Your computer is set up ready for use with the supplied mouse. A mouse is another means of entering information into the computer. It is a small desk-based object with two buttons. You press or *click* these buttons to select options from the screen. This can considerably speed up your use of the computer.

You may not be able to use your mouse with all types of software.

The Monitor

Your computer is supplied with a Super VGA (video graphics array) display adapter. You can use a VGA, or Super VGA monitor (in various sizes) with your computer. Contact RM for more information on monitors or consult your RM Sales catalogue.

Information appears on your monitor in either *text* or *graphics modes*, depending on the software you are using. Both text and graphics modes use a display of pixels. These are tiny dots that light up to form a screen message or picture. Each dot can be a different colour (or intensity level on a monochrome monitor).

In text mode, there are usually 80 columns and 25 rows in which characters appear. Each character is formed from a number of pixels.

In graphics mode, these pixels are in a denser matrix of columns and rows; for example, 640 columns and 480 rows. Windows uses graphics mode.

Screen modes

The screen mode (the format in which the information is presented on the screen) is defined as follows:

- The *resolution* of the display is the number of columns and rows of characters (text) or pixels (graphics).
- The number of available colours or shades of grey.

Screen modes can be shown as follows:

```
640 x 480 pixels x 256 colours
```

which represents a graphics mode with 640 columns and 480 rows. 256 colours can be displayed at any one time.

Some programs automatically select the screen mode which is most suitable for your system and the program. Other programs must be configured to select different modes.

You can also fit cards to give extra, higher graphics resolutions. In this case you may need to remove the existing SVGA adapter.

There is additional help on setting up resolutions and refresh rates to match your monitor in the RM PC Help.

Connecting to a Printer

Printers must be carefully selected to produce the output you want. They must also be set up correctly. This can take some time and thought, depending on your printer and which software you want to use.

Compatibility

The printer you choose must be compatible with the IBM® PC-AT range of computers.

Make sure that your application programs work with the printer you want to use. You may need special printer drivers.

Choosing a Printer

The range and quality of work produced on a printer varies with the type of printer you choose. We advise you to use a parallel printer, rather than a serial printer, if possible. Parallel printers are easier to set up and use than serial printers.

- A dot matrix printer is relatively cheap and produces acceptable quality for most purposes.
- A laser printer costs more but produces excellent quality output for both text and graphics.
- A PostScript® laser printer provides special features which are useful for applications such as high-quality desktop publishing, for example, special graphics features and support for fonts. Much of the information on the following pages does not apply to PostScript printers.

Setting up a Printer

These general instructions are to help you set up your printer. You will also need to refer to the manual provided with your printer.

1. Find out from your printer manual if your printer is a serial or parallel printer, or both. If your printer can be either, use the parallel connector and cable as this is generally simpler and faster than serial printing.
2. Attach one end of the printer cable to the correct connector (parallel or serial) on the rear of the computer and attach the other end to the printer.

   If the cable does not fit into your computer's connector, you may need a different cable. Tell your supplier that your computer is compatible with the IBM PC-AT range of computers.
3. Plug the printer into the mains and switch on.
4. Load the printer with paper as instructed in the *printer manual*.
5. Now select the printer as specified in next section.

LPT1

LPT1 is the device name of the standard parallel port or connector. Many application programs send their output to LPT1 unless you select an alternative.

Your computer and any peripheral devices connected to it may be capable of using faster parallel port modes - either EPP or ECP. Check the installation manuals with other devices which you are going to attach to your computer. To enable these modes it is necessary to enter the system SETUP program. It may also be necessary to configure the system board to support DMA in ECP mode - See the *System Board User Manual* for details.

There is step by step help on setting changing to ECP mode for Windows 95 in the RM PC Help.

Note that both EPP and ECP ports are completely compatible with existing parallel ports, and may be used in standard printer modes if the enhanced modes are not applicable.

COM1 and COM2

COM1 is the device name of the standard serial port or connector on your computer. You need to select this port before application programs can use it.

COM2 is also a serial port and, if not needed for a serial mouse, may be used for any other standard serial device.

How to Select the Printer

There is help on installing printers in the RM PC Help.

You can also set the printer as default for all Windows applications by selecting the ‘Set As Default’ button.

Setting Serial Communication Parameters

The following settings must have the same values on your computer as they do on the serial printer:

- baud rate
- parity setting
- word length (or number of data bits)
- number of stop bits

Find out the printer settings from your *printer manual*. The computer and printer settings should match.

Testing your Printer

Your printer will probably be supplied with a self-test routine which checks that it is working. If so, the self-test routine will be described in your *printer manual*.

To check that your printer works with your computer, try printing the test page within the latest version of Windows.

If your printer does not print, check that:

- You have switched on the printer and it is "on-line".
- The printer is not jammed or out of paper.
- You have correctly connected the cable.
- If it is a serial printer, you have set up the serial communication parameters correctly.
- You have the correct switch settings.

Connecting to a Network

A network is a number of computers which are connected together. These computers can share applications and exchange data. The network consists of a *server* and at least one *network station*. The server stores the software and the users' files; the network station is a computer used by anyone wanting to access the information and applications on the server.

If you purchase a network interface, it will have a network connector to which a cable can be attached to connect the computer to a network. The connector(s) protrudes through one of the inner panels of the rear panel expansion slots. The type of connector depends upon your station type which could be one of the following:

- Ethernet "thin-wire" (10 base 2) BNC.
- Ethernet "thick-wire" (10 base 5) AUI.
- Ethernet "twisted-pair" (10 base T) UTP.
- Fast Ethernet (100 base TX) UTP.

Consult your network administrator and the documentation supplied with your network operating system for further information on connecting up and configuring the network.

Chapter 3
Fitting Hardware Options

Several hardware options can be fitted in your computer. Fitting additional options upgrades the performance of the computer and can increase its capabilities. This chapter covers the following topics:

- How to remove and replace the cover of your computer.
- How to fit and remove expansion cards.
- How to fit and remove DIMMs.
- How to fit and remove upgrade processors.
- How to fit and remove disk drives.

Selecting options

A full list of the options that can be purchased from RM is given in the RM Systems price list. Before buying an upgrade from a manufacturer other than RM, we advise you to contact RM to ensure that the option you intend to buy is suitable for use with your computer.

Fitting options

Some hardware options can be fitted by you; others must be fitted by RM. If you buy an RM upgrade which can be fitted by you, the upgrade is supplied with its own fitting instructions which you should follow. However, if you buy an upgrade from another manufacturer (such as additional SIMMs), it may have no instructions and you may be directed to the computer manufacturer's information (i.e. this chapter).

If you prefer to have the upgrade fitted for you, contact RM Services on (01235) 826617.

Internal Structure of the Computer

The internal structure of the C-Series computer can vary depending on the model. The system board may vary in each model so each system is supplied with a software copy of it's own *System Board User's manual*.

The system board has a number of expansion slots which may have adapter cards already fitted (e.g. a PCI graphics card). There may also be other adapter cards for connecting to items such as a network or a tape drive unit.

The floppy disk drive can be found in the smaller centre drive cage. The hard disk drive can be found underneath the floppy disk drive. This leaves room for expansion in the larger drive bay for external drives such as ZIP drive, tape backup drive and a CD-ROM drive (unless already fitted).

WARNING:
Remember that electricity is dangerous. If you do not unplug your computer, you may damage the parts inside it. You may also damage yourself.

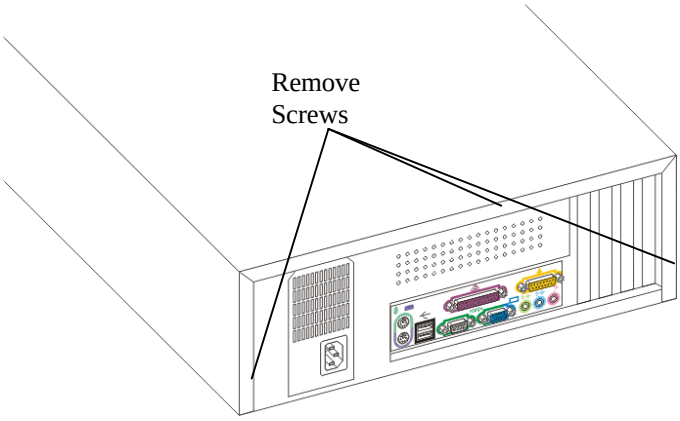
We strongly recommend you to wear an **earthing wristband** when touching internal computer parts to avoid damage due to static electricity. See page 45 for details on how to attach a wristband to your computer.

The Cover of the Computer

Removing the Cover

Toolbox: Pozidriv no. 1 screwdriver

1. Switch off your computer and unplug it from the mains.
2. Remove the security cable or padlock (if fitted). Switch off, unplug and disconnect all attached equipment (including the monitor, mouse, keyboard and any network cable(s)).
3. Unscrew and remove the three screws which secure the cover to the rear panel. Put these screws in a safe place.

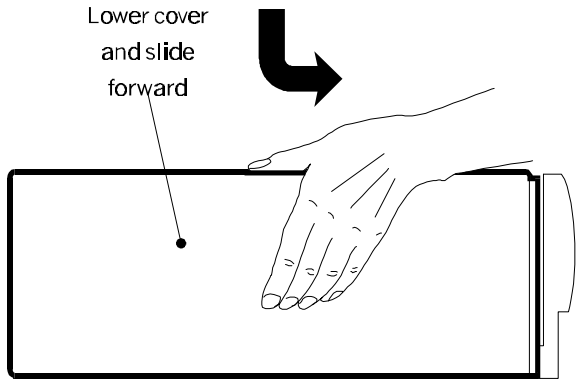


5. Slide the cover backwards (about 2 cm) to disengage it from the front moulding of the case. Lift the cover up and off and put it in a safe place.

Replacing the Cover

Toolbox: Pozidriv no. 1 screwdriver

1. Make sure that all the internal cables are tucked safely out of the way, so that they will not be caught between the cover and the internal frame.
2. Place the cover onto the case so the security bracket sticks out the back (about 2 cm from the front moulding). Slide the cover forwards until it is flush with the front moulding

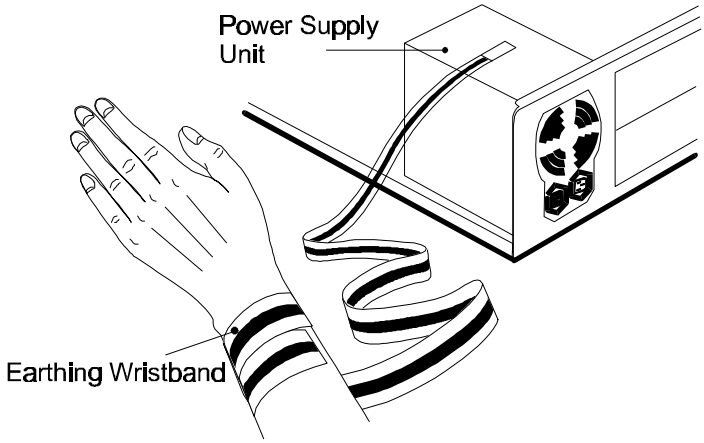


3. Refit and tighten the three screws securing the cover to the rear panel.
4. Gently place the monitor on top of the case.
5. Connect up your computer and the rest of the system as shown on the “Setting Up Your New Computer” card (supplied).

Protecting Against Static Electricity

STATIC WARNING:
Before handling any of the components in the computer, take precautions against damage caused by static electricity on your body.

If you have an earthing wristband, attach it to the power supply unit. Make sure that it is connected to a metal part of the power supply unit and not to a label.



If you do not have an earthing wristband, always discharge any static electricity which may have built up on your body before touching any components. To do this, touch the unpainted metal rear panel of the computer near the mains inlet.

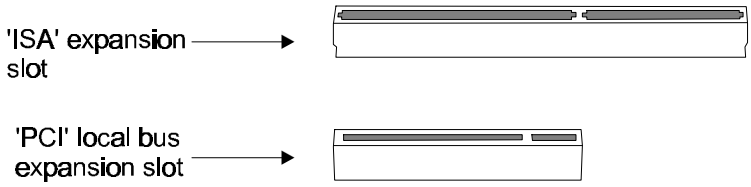
If you take a break from working inside the computer, repeat the above procedure before you restart. You need to discharge new static which may have built up in your body.

Adapter Cards

You can enhance the capabilities of your computer by inserting adapter cards into the bus expansion slots. 16-bit ISA (Industry Standard Architecture) cards or PCI local bus cards (full-size or half-size) can be fitted in the computer using the expansion slots.

The positioning of the adapter cards may vary so refer to the expansion label for identification of the various adapter cards. The positioning of the adapter cards do not affect the general procedures given in this chapter but you may have to rearrange them in order to fit a new adapter card.

You can remove adapter cards and refit them into any other similar slots. The position of some adapter cards may be affected by the length of the adapter card, route of cables attached to them or whether they require a specific type of slot; e.g. ISA or PCI or perhaps a bus master slot.

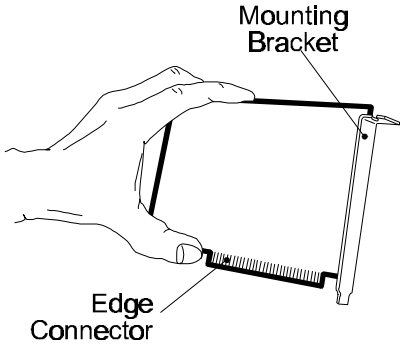


(If you have an older ISA card it may be only 8-bit and therefore only fits into half of the ISA slot).

Handling Adapter Cards

STATIC WARNING:
Ensure that cards and chips are not damaged by static that builds up on your body.

- If you have an earthing wristband, put it on before touching any card or chip (see page 45).
- Hold an adapter card by the glass-fibre edges or by the mounting bracket connected to the card as shown below.



- Avoid touching either the electrical components that are mounted on the card or the gold edge connector.

The following instructions tell you how to fit or remove cards in a particular slot but the principles apply to any vacant slot.

Fitting a Card

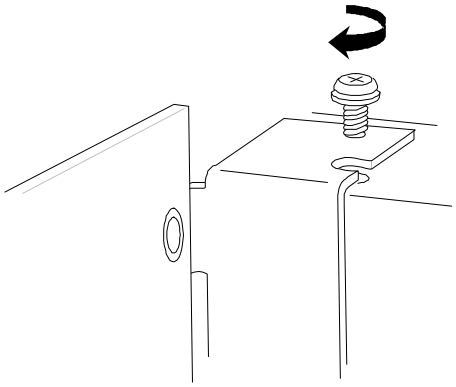
Toolbox: Pozidriv no. 1 screwdriver

1. Remove the cover (see page 43).
2. Select a slot that is appropriate for the card, e.g. ISA, or PCI local bus.

Note:
The position of the different types of expansion slots are in your *System Board User's manual* (supplied).

3. Unscrew the single screw at the side of the appropriate blanking plate and remove the blanking plate. Put the screw in a safe place.

   You no longer need the blanking plate but keep it in case you want to remove the card in the future.
4. Prepare the card for fitting. Make sure you have set any switches or jumpers on the card. The manufacturer's documentation accompanying the card should tell you how to do this.
5. Holding the card by the edge taking care not to touch any components align the mounting bracket with the rear panel. Lower the card until the mounting bracket is located in the correct slot and the edge connector is in the socket on the system board. Push the card firmly but gently into place. Make sure that any external connectors project correctly from the rear panel.
6. When the card is fitted correctly, the screw cut-out on the card mounting bracket should be lined up with the screw hole on the case. Insert the blanking plate screw you removed earlier and use the screwdriver to tighten it. Avoid over tightening the screw.



7. Plug in any cables or leads you may need. Refer to the manufacturers instructions provided.
8. Replace the cover of the computer (see page 44).

Removing a Card

Note:
If you need to remove any cables please make a note of the orientation BEFORE removal.

Toolbox: Pozidriv no. 1 screwdriver

1. Remove the cover (see page 43).
2. Disconnect any cables connected to the card making a quick sketch of their orientation and where they plug into. You can then refer to the sketch if you need to refit the card.
3. Unscrew the single screw on the card mounting bracket and put the screw in a safe place.
4. Holding the card by the upper edge or corners, gently pull the card up, rocking the card from side to side if necessary.
5. Remove the card from the computer and put it in a safe place (preferably in an anti-static bag or container).
6. Replace the metal blanking plate which was removed when the card was fitted and screw it into place.
7. Replace any cables you disconnected earlier.
8. Replace the cover of the computer (see page 44) and reconnect your system as shown on the “Setting Up Your New Computer” card.

DIMMs

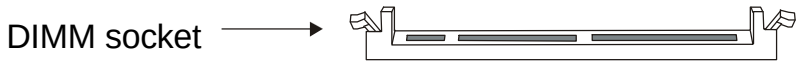
Your computer may use Dual In-line Memory Modules (DIMM) to provide random access memory (RAM).

All C-Series computers are supplied with a minimum 16 MB of RAM. The system board in your computer can be upgraded using the additional sockets available.

See the RM Systems price list for details on memory upgrade kits.

Depending on the model, there may be a number of 84-pin DIMM sockets on the system board. Memory modules can be fitted in these sockets in certain arrangements only. Do not use other combinations. If you do so, your computer may not operate correctly.

The different memory module combinations and sockets are specific to each model of RM computer. Refer to the *System Board User's manual* (if supplied) or contact RM for details of allowed combinations.

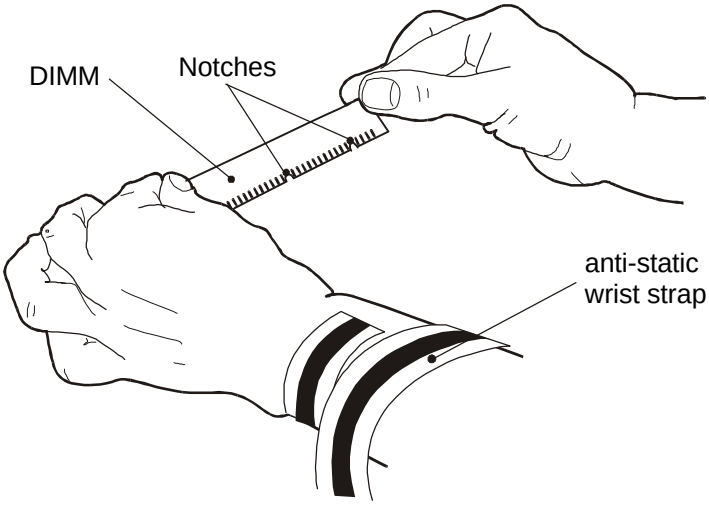


Fitting a DIMM

These instructions refer to fitting a DIMM.
N.B. The retention mechanism on the sockets may vary from those illustrated.

1. Remove the cover (see page 43).
2. Hold the DIMM at a 90° angle to the empty socket with the notches on the DIMM aligned with the notches on the empty socket.

Note:
The DIMM has a polarising notch slightly off centre so that it cannot be fitted incorrectly.



3. Keeping the DIMM at this angle, slide it between the slots at each end of the DIMM socket it horizontal and at a 90° to the socket. Press the DIMM firmly into the socket, the retaining clips will 'click' into place , securing the DIMM at each end of the socket. Make sure that both of these clips are in the vertical position.

4. Replace the cover of the computer (see page 44) and reconnect your system as shown on the "Setting Up Your New Computer" card.

5. When you switch on your computer, the system automatically detects the extra memory and updates the CMOS RAM.

   On some models you may need to enter the Setup program to confirm the CMOS RAM, in this case the following message is displayed:

   ```
   RUN SETUP UTILITY
   Press <F1> to RESUME
   ```

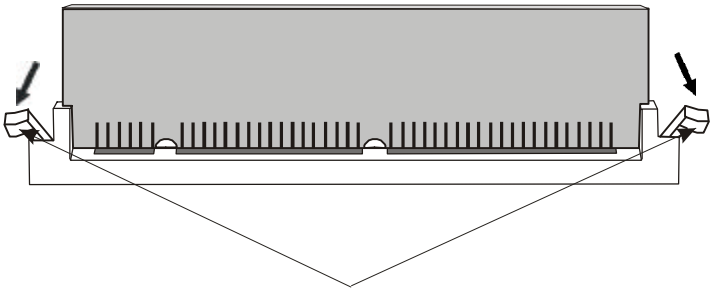
   Press <F1> to run Setup. Enter your password, if the system prompts you to do so (for default password see page 80). At the main menu, save the changes. The system will reboot.

   Check the memory test during boot-up to see that the correct amount of memory has been detected and that your upgrade is working correctly.

6. Replace the cover of the computer (see page 44) and reconnect your system as shown on the "Setting Up Your New Computer" card.

Removing a DIMM

1. Remove the cover (see page 43).
2. Using your fingers, push the plastic retaining clips down and away from the DIMM to release it from the socket. The released DIMM can then be lifted up and out of the slots at either end of the DIMM socket. Take care not to damage the socket when removing the DIMM.



DIMM retaining clips

3. Replace the cover of the computer (see page 44) and reconnect your system as shown on the “Setting Up Your New Computer” card.
4. When you switch on your computer, the system automatically detects the extra memory and updates the CMOS RAM.

   On some models you may need to enter the Setup program to confirm the CMOS RAM, in this case the following message is displayed:

   ```
   RUN SETUP UTILITY
   Press <F1> to RESUME
   ```

   Press <F1> to run Setup. Enter your password, if the system prompts you to do so (for default password see page 80). At the main menu, save the changes. The system will reboot.

Check the memory test during boot-up to see that the correct amount of memory has been detected and that your upgrade is working correctly.

5. Replace the cover of the computer (see page 44) and reconnect your system as shown on the “Setting Up Your New Computer” card.

System Board Upgrades

Note:
Links on the systemboard may need moving for any of the systemboard upgrades. Refer to the *System Board User’s Manual* provided.

Processor

There are a number of different processor upgrades (depending on the model of computer) which can enhance the performance of your computer. All processors are fitted in to a ZIF (Zero Insertion Force) socket for easy removal and upgrading.

If you wish to purchase any of these upgrades, contact the RM Sales Desk for more details.

Fitting a Processor

Note:
You WILL need your *System Board User’s Manual*. The location of the socket and all link settings for processor types and speed is given in this manual.

These instructions assume you have removed the cover according to the instructions given on page 43.

1. Locate the processor socket on the system board. The processor will be covered either by a heatsink (a metal construction like a hedgehog) or a small fan .

Caution:-
A heatsink is used to dissipate heat from the processor so it may be HOT.

2. Lift the lever of ZIF socket and remove processor. Replace with new upgrade processor. Ensure that pin 1 (marked with dot or corner cut) is located correctly.
3. Replace the original heatsink or fit the small fan supplied with the upgrade onto the new upgrade processor. Move any link settings required.
4. Replace the cover of the computer (see page 44) and reconnect your system as shown on the “Setting Up Your New Computer” card.
5. Check on start-up that the correct processor type and speed is detected.

Drive Upgrades

Your C-Series computer can have a number of different drive upgrades. There is space for up to two external drives. The external drive upgrades could be any of the following:-

- ZIP drive
- CD-ROM drive
- tape backup unit

Note:
Your computer may have been supplied with additional drives as fitted options.

Specific fitting instructions are provided with all drive upgrades.

Fitting a Drive

These instructions assume you have removed the cover according to the instructions given on page 43.

1. Unscrew and remove the metal EMC screening plate which is across the front of the drive bay.

   You no longer need the EMC screening plate but keep it in case you want to remove the drive in the future.

2. Remove the plastic case front panel.

3. Remove the plastic blanking panel that covers the front of the drive bay.

4. Fit the drive upgrade into the drive cage by sliding it in from the front.

5. Align the disk drive with the flat face on the front of the computer then secure the disk drive in the drive cage using four screws, two on each side, taking care not to over tighten them and that they are the correct length.

6. There are several flying lead connectors from the power supply unit used for connecting additional disk drives, select the large connector and connect this to the power connector at the rear of the drive. The connector is polarised to prevent you fitting it upside down.

7. The drive signal cable will be supplied either in the upgrade or for a floppy drive upgrade the existing cable supplied in your computer can be used. Connect up the cable according to the specific upgrade instructions. The drive is normally marked and the connectors are polarised to prevent incorrect fitting.

8. Replace the cover and front panel of the computer (see page 44) and reconnect your system as shown on the “Setting Up Your New Computer “ card.

Specific fitting instructions are provided with all drive upgrades.

- A CD-ROM drive upgrade or tape backup unit may need extra software installed in the form of a drivers disk.
- A floppy drive or hard disk drive upgrade may need to be set up in the CMOS Setup program (see the *Systemboard User Manual* for details).

Chapter 4
Maintenance, Service and Troubleshooting

This chapter covers the following:

- looking after the computer
- moving and re-packing the computer
- returning the computer for service
- Problem solving - if things go wrong and you cannot sort out the problem contact RM Customer Support.

There is a current list of phone numbers in RM PC Help.

Looking After Your Computer

If you do not use the computer for a while, protect it with a dust cover.

General Maintenance

Always make sure that the computer is switched off before you attempt to do any cleaning.

Clean your computer regularly. Dust the keyboard, monitor casing and computer. Use a damp cloth and mild glass cleaner to clean the monitor screen, but be careful not to press hard on it.

Make sure that no liquid seeps into any of the equipment especially the inside of the computer or keyboard so keep food and liquids away. Avoid using aerosols or strong cleaning agents.

Do not use a damp cloth to clean floppy disks.

Do not attempt to clean the interior of the computer. This service should only be performed by a fully qualified RM technician.

Moving and Re-packing the Computer

If you need to move your computer a short distance - to an adjoining room for example - disconnect all equipment connected to the computer.

1. Ensure that the floppy disk drive LED is off and remove any floppy disks from the floppy disk drive(s).
2. Close down the operating system then check that the hard disk drive LED is off.
3. Switch off your computer, the monitor and any other equipment attached to it.
4. Disconnect any equipment from your computer and disconnect the computer from the mains.
5. Prepare the new surface to put your computer on. It should be flat, firm and dry.
6. Carefully lift your computer and put it down gently at its new location.

7. Reconnect your system as shown on the “Setting Up Your New Computer” card.

Remember, if you move your computer from a cold room to a warm one, allow the computer to warm to room temperature before switching it on.

Servicing

Switch off the computer and contact RM Customer Support if any of the following occurs:

- liquid gets into the computer
- the computer has been dropped or suffered a severe jolt
- electrical fuses 'blow' repeatedly
- the mains lead appears frayed or damaged
- the computer behaves abnormally

If you need to return the computer to RM, make a new backup of all the contents on the hard disk (if fitted) and keep these copies in a safe place. Do not overwrite any recent backups of the hard disk. Pack the computer back into its original packing.

There is help on obtaining a service call number in RM PC Help.

Problem Solving

Keep a note of what happens when you carry out the checks in this chapter. If the checks do not help, turn to page 70 for what to do next.

Computer

The green power light does not come on when you switch on the computer.

- Is your computer set up as shown on the “Setting Up Your New Computer” card?
- Is your computer switched on at the mains and at the computer?
- Is the fuse in the plug blown? Replace the fuse (see page 3).
- Does the mains supply work? Try another item of equipment in the same socket.

WARNING:
A blown fuse can be a sign that connections are incorrect or that the wiring in the plug is wrong. A fuse can also blow if the computer overheats: check that nothing covers the ventilation holes on the back panel.

Keyboard

Nothing happens when you type on the keyboard.

- Is your system set up correctly as shown on the “Setting Up Your New Computer”card?
- Is your keyboard correctly plugged into the keyboard connector at the rear of the computer?
- Are you using an application? Press <Num Lock>. If the <Num Lock> indicator light comes on, the computer is probably busy performing a time consuming task. If the light does not come on, you may need to close down the application by pressing <Ctrl/Alt/Del>.

- Have you tried another keyboard (if possible)?

Mouse

The mouse does not work.

- Check the mouse is plugged into the correct port.
- Check you have the correct mouse drivers loaded if required.

Peripherals (Printers and other Input/Output devices)

Equipment connected to your computer does not work.

- Do you have the correct cable?
- Has the equipment been set up correctly? (See "Connecting to a Printer" beginning on page 36 for information on setting up a printer.)
- Has the equipment been started up correctly?
- Have any switches on the inside or the outside of the equipment been incorrectly set?
- Has your computer been set up to recognise the equipment?
- Has your software been configured to use the equipment? If it needs a special driver, has the driver been installed correctly?
- Does the equipment work on another computer which has been configured exactly the same?

Monitor

The monitor screen is blank when you switch on or the monitor screen shows a display, but it is unreadable.

- Is your system set up as shown on the “Setting Up Your New Computer”card? Check especially that the monitor signal cable connector for the correct orientation or bent pins.

- Is your monitor switched on at the power source and the monitor? Most monitors have an "on" light.

Note:
Some monitors need the monitor signal cable plugged in to the computer and the computer switched ON before the monitor will power up. If the monitor is not receiving a signal from the computer the “on” light may flash.

- Is the brightness turned up, and other controls adjusted correctly?
- Is your monitor compatible with your computer, and do you have the correct cables?
- Does your monitor work correctly with other computers?
- Does your computer work with other monitors?
- If initially OK but when you re-boot it is unreadable, the refresh rate or resolution has been setup incorrectly by the system software. Try setting to a lower resolution.

The screen "freezes" and you cannot enter information.

- Is the application waiting for a particular action or command?
- Is the application looking for something - such as a disk which has not been inserted in the floppy disk drive?
- Resetting your computer: If you cannot "unlock" the screen, press the reset button (see page **Error! Bookmark not defined.**) on the front of the computer. However, work you have not saved will be lost.
- Does the same software function work on another computer?

Software

You cannot locate a file.

- Have you typed the correct filename? Do you need a particular filename extension (for example, .DOC or .PIC)? Do you need to specify a path (a drive and/or a directory)?

- Try using the Find command which can be found from the Start menu on the bottom of the Windows desktop.
- Verify the contents of the disk by using the SCANDISK utility . (Windows NT has a repair disk Utility). See the *Help file* for further information.
- If the file is on a floppy disk, is the disk properly inserted in the floppy disk drive? Check that the shutter on the floppy disk moves freely (3½ inch only).
- If something is stuck in the drive (such as a floppy disk label) pull it out gently if you can. Do not insert a screwdriver or anything similar into a disk drive. If you have a problem, contact a qualified service engineer for advice.
- If you have another computer with the same application installed, copy the file from one computer to the other and try again.

You cannot save a file.

- Is the hard disk or floppy disk full?
- Are you trying to save the file to a write-protected disk? See page 26.
- Are you working on a network and trying to save the file to a location to which you have no "write" access?
- Are you trying to save a file that is **read only**. See your *operating system manual* for further information.

Forgotten Passwords

If you forget your password, you will need to return your computer to RM to be reset. This reset is not covered by your warranty agreement.

CHOOSE A PASSWORD WHICH YOU WILL REMEMBER.

Since RM will need to ensure you are the owner, you may need to provide some further identification, to prevent unauthorised access to your computer.

Hard Disk Problems

This section provides some guidance on investigating problems with the hard disk. You should make sure when trying to solve hard disk problems that you do not erase important files unnecessarily.

> Note:
> Make regular backups of files on the hard disk and keep backup disks of applications.

The computer appears to be operating slower than normal and with prolonged periods of disk access.

- The hard disk may be nearly full or have errors. Check using the SCANDISK utility (see the *Windows Help file*). If full, try emptying the recycle bin or deleting any unnecessary files to free up some space on the hard disk (e.g. old files or files with .BAK, .CHK or .TMP extensions).
- The files on the disk may have become fragmented. Check by using the DEFRAG utility (see the *Windows Help file*).

You cannot boot up using the hard disk.

- Does the hard disk LED flash during start-up? Run the FDISK command (see the *operating system manual*) and check for an active partition. Note: Hard disk drives bigger than 2.0GB may have two partitions.

> Beware:
> FDISK can destroy the information held on your hard disk if you re-partition.

- Check to see whether the BIOS System Configuration screen (displayed during start-up) reports a hard disk is present.

> **Note:**
> Some viruses can change the BIOS configuration so check by running a virus checking program.

- Run the Setup program and ensure that the hard disk type is correct (see page 79 for information on the Setup program).
- Is it possible to start up the system using a boot disk and then read the information on the hard disk? If so, see the problem explanation below.
- If you cannot access any of the information on the hard disk, contact RM.

You cannot start up using the hard disk but can access the disk when you start up from floppy.

Make a backup of the contents of your hard disk before trying the following.

- Try running the SYS command from C:\WINDOWS\COMMAND. This will transfer a new copy of the system files onto the root of the hard disk. The system files may have been accidentally deleted from the hard disk.

Error Messages During Start-up

If a non-fatal error is detected during start-up (i.e. an error which does not prevent the system from starting up), an error message is displayed on your screen. Note the error message and then press <F1> to continue.

If the POST (Power On Self Tests) detects a fatal error during start-up (i.e. an error which will not allow the system to continue the start-up procedure), your computer has developed a serious problem. Fatal errors are usually communicated through a series of audible beeps.

This section lists some of the error messages which are displayed and suggests how to correct the error using the Setup program. See the ***Systemboard User Manual*** (found in the white envelope labelled Technical Information) for more error codes, beep codes and how to use the Setup program.

CMOS Battery State Low

The battery in your system, which provides power to CMOS to store the system settings, is low in power and needs to be changed or recharged (depending on the battery type). Leave the computer switched on for 48 hours to recharge the battery.

CMOS Checksum Failure

When you save changes made in Setup and exit the Setup program, a checksum value is generated. This value is stored and used for error checking. If this stored value is different from the value determined by the POST routines during start-up, the CMOS Checksum Failure error message is displayed. Change the Setup to the optimal settings then change any additional variances according to the model of computer (see page 79 for details on the Setup program). If this error message is displayed frequently, you may have a hardware problem and should contact RM.

Note:
Some viruses can change the BIOS configuration and cause a checksum failure. Check by running a virus checking program.

CMOS System Options Not Set

The system settings stored in Setup are either corrupt or non-existent. Run the Setup program and make any necessary changes. If the password options have been corrupted, the password reverts to the default password. See page 80 for details of the default password.

Keyboard Error

There is an error with the keyboard connector or a key is being held down. Check that the keyboard connector is plugged into the rear of the computer correctly.

CMOS Memory Size Mismatch

The BIOS has detected a difference between the amount of RAM in the system and the amount stored in the Setup program. Press <F1> to run Setup. The correct memory size is recorded automatically.

FDD Controller Failure

The BIOS is unable to communicate with the floppy disk drive controller. Switch off the system and then check all the connections going to the floppy disk drive, also check the connections to where the cables go to on the cards. If this error message returns when you switch on again, you may have a hardware problem and should contact RM.

HDD Controller Failure

The BIOS is unable to communicate with the hard disk. Switch off the system and then check the power and interface cables to the drive. If this error message returns when you switch on again, you may have a hardware problem and should contact RM.

C: Drive Error D: Drive Error

The BIOS is not receiving a response from either hard disk drive C or D. Check the type of hard disk selected in Setup. Re-run the auto-detect function in the Setup program (see page 79 for information on the setup program).

C: Drive Failure D: Drive Failure

The BIOS is unable to obtain any response from either hard disk drive C or D. You may have a serious problem with your hard disk and should contact RM.

CMOS Time & Date Not Set

The time and/or date are not set. Run the Setup program (see page 79) and set the date and time.

Diskette Boot Failure

Check the power and interface cables to the floppy disk drive. Alternatively, the floppy disk is corrupt and cannot be used to start up (boot) the system. Use another boot disk and follow the instructions on the screen. Also check for viruses on your hard disk.

Invalid Boot Diskette

The BIOS can read the floppy disk but the disk cannot be used to start up (boot) the system. Use another boot disk and follow the instructions on the screen. Also check for viruses on your hard disk.

Before you Ring for Help

If you have tried the suggestions on the previous pages and the problem remains, contact either RM or your supplier for help.

1. Make sure you can provide full details of your system. If you have not already done so, fill in the form on the inside front cover of this manual so that you can give a quick reply to questions asked about your computer.

   Make sure you know the serial number and part number of your computer when you ring RM. You should also have your Service Call Number with you when you ring.

There is help on obtaining a service call number in RM PC Help.

2. Find out as much as you can about the problem and its effects so that you can describe it clearly. If you can reproduce the problem, note how you did it before calling.
3. Make a careful note of the circumstances which led up to your problem.
   - What software was loaded?
   - What happened when you tried the suggestions given on the previous pages?
   - Have you changed any settings in the Setup program?

If possible, ring RM with your computer in front of you so that you can try out any suggestions given to you.

Chapter 5
Technical Information

This chapter provides detailed information about your C-Series computer.

General Specification

System Board

The system board may vary from model to model so each computer is supplied with software copy its own technical *System Board User's Manual*.

Power Requirements

Your C-Series computer is fitted with a 90W Power Supply Unit (PSU). The voltage and frequency of the mains output are the same as those of the mains input. The maximum input and output current and mains frequency figures are given for 200/240V and 110/120V.

Mains voltage required:	220/240V	110/120V
Maximum input current from mains:	3A (a.c.)	6A (a.c.)
Mains frequency:	50 - 60 Hz	50 - 60 Hz

Internal power supply unit rated output (approx.):	90W

Battery

There is a battery inside the computer which maintains the system settings held in CMOS memory, including the system date and time. The battery is built on to the system board so check the *System Board User's manual* for details on what type of battery is fitted.

- Re-Chargeable battery

  This battery can maintain the CMOS memory for up to three months when fully charged. The battery is automatically recharged whenever the computer is switched on and cannot be removed from the computer. It should take approximately 14 hours to recharge the battery totally.

  If this type of battery develops a fault and needs to be replaced, the computer will need to be returned to RM Services for repair.

Note:
Do not leave the computer switched off for more than three months, as the system may revert to default settings. Make sure that the battery is fully charged if you do not intend using the computer for any length of time.

- Lithium battery

  This coin cell style battery is fitted on to the system board in a socket for easy replacement. This type of battery has an estimated lifetime of at least seven years.

- Sealed Lithium battery

  This type of battery is built into the real time clock (RTC) chip which is fitted into a socket onto the systemboard for easy replacement. This type of battery has an estimated lifetime of at least 10 years.

Physical Specifications

Dimensions: 420(D) x 395(W) x 135 mm (H) with feet

Weight:	Up to 15 Kg - including hard disk drive, floppy disk drive (3.5”), CD-ROM drive, PSU and standard adapter cards

Safety

This product complies with EN60950, the standard for the safety of information technology equipment, including electrical business equipment.

Ergonomics

The system hardware complies with the EEC directive 90/270/EEC and the British Standards BSEN29241 (part 3) and BS7179 (part 4) for ease and comfort of use.

Electro-Magnetic Compatibility (EMC)

On the 1st January 1996 the new Electromagnetic Compatibility Directive (89/336/EEC) became a legal requirement on all electrical and electronic equipment. RM products comply fully with the European Directive.

The relevant standards are EN50082-1 and EN55022 and these require:

- Protection from spurious mains power interference
- Immunity from external radio frequency interference
- Safeguards against static discharges (ESD)
- Reduced radio frequency emission from PCs

Environmental Factors

Recommended working ambient temperature range: 5 - 35°C. Humidity conditions of between 20% and 80% (non-condensing).

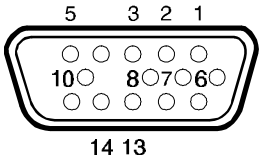
Recommended maximum elevation above sea level for operation: 3,300 metres.

The computer should not be subjected to vibration or shock. Always transport your computer in its original packing material.

Connectors

Video Signal Connector

At the back of your C-Series computer there is a video connector: VGA analogue, 15-way DIN in 9-way shell, 3-row D-type.



1	Red (O)		9	Not used
2	Green (O)		10	Digital ground
3	Blue (O)		11	Not used
4	Not used		12	Not used
5	Digital ground		13	Horizontal sync. (O)
6	Red return	⎫	14	Vertical sync. (O)
7	Green return	} Analogue	15	Reserved
8	Blue return	⎭ grounds		

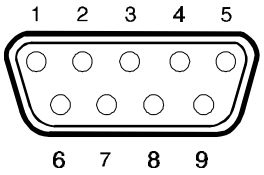
Monitor Power Connector

Type: IEC 230V, 1A (a.c.)

Output: Voltage - same as the input to the computer.
Current - 1A maximum.

Serial Connector

At the back of your C-Series computer is the serial connector: RS232C asynchronous, 9-way male D-type connectors. The 9-pin plug wiring is the same as an IBM serial adapter for the IBM PC-AT, giving an RS232-like interface.

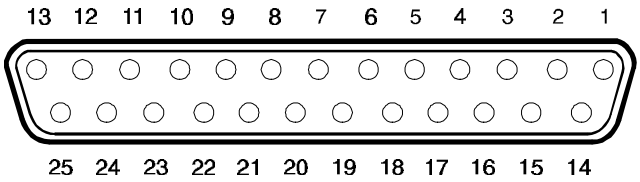


Pin Number	Function	Direction
1	DCD + carrier detect	to computer
2	RX - received data	to computer
3	TX - transmitted data	from computer
4	DTR + data terminal ready	from computer
5	GND signal ground	not applicable
6	DSR + data set ready	to computer
7	RTS + request to send	from computer
8	CTS + clear to send	to computer
9	RI + ring indicator	to computer

+ indicates active high
- indicates active low

Parallel Connector

There is one parallel connector at the back of your C-Series computer:- AT compatible 25-way female D-type connector. Note: EPP/ECP signals are not shown - see *the System Board User Manual*.

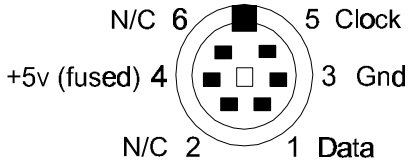


Pin Number	Function	Direction
1	- strobe	from computer
2	+ data bit 0 (lsb)	from computer
3	+ data bit 1	from computer
4	+ data bit 2	from computer
5	+ data bit 3	from computer
6	+ data bit 4	from computer
7	+ data bit 5	from computer
8	+ data bit 6	from computer
9	+ data bit 7 (msb)	from computer
10	- acknowledge	to computer
11	+ busy	to computer
12	+ paper end (out of paper)	to computer
13	+ select	to computer
14	- autofeed	from computer
15	- error	to computer
16	- initialise printer	from computer
17	- select input	from computer
18-25	ground	not applicable

+ shows active high
- shows active low

Mouse and Keyboard Connector

At the back of your C-Series computer there are two identical standard IBM PS/2 style connectors. One is for a PS/2 style mouse and the other is for a PS/2 style keyboard.



System Setup (CMOS) Program

The BIOS has a built in setup program which allow the user to modify the computer's basic system parameters. This information is stored in the battery backed CMOS memory.

Your computer has been set up by RM and is ready to use.

Use the CMOS Setup program to change the system settings if:

- you change the amount of memory in your computer
- you add or change a disk drive
- you want to change the password
- you want to set up special features.

Caution:
Do not attempt to run Setup and change the system settings unless you understand what you are doing. You can experience serious problems when using your computer if you select incorrect settings in Setup.

Full details on entering, changing the system settings and saving changes and exiting are in the *System Board User's Manual* (see the white envelope labelled Technical Information).

Important:
Before changing any system settings make a record of all current settings first.

Changing the password

Password protection can be used to keep your data secure by preventing unauthorised access to the system and Setup program. By default, the Setup program is protected by a password.

The password can be a maximum of eight characters, i.e. you can use any letter or number. The password may be case sensitive. Be very careful to choose a password that you will not forget and others will not be able to guess.

Caution:
You should change the default password as soon as you receive your computer. If YOU do not change the default password, someone else may change it for you and prevent you from accessing the system.

If you forget your password, you will need to return your computer to RM to be reset. This reset is not covered by your warranty agreement. REMEMBER THIS BEFORE YOU CHANGE YOUR PASSWORD - CHOOSE A PASSWORD WHICH YOU WILL REMEMBER.

The first time you change the password

The first time you select this option, you will need to enter the default password. The default password is the password which has been set up by Research Machines for use until you change the password.

The default password is **RM**

When you have entered the default password correctly, the system prompts you to enter the new password. You will have to enter the new password twice for confirmation.

Glossary

Below is a list of terms with notes on their meaning in the context of this manual.

16-bit	The number of bits of information which can be dealt with by the hardware at one time.
Adapter card	A card which fits inside the computer to enhance its performance or capabilities.
application	A particular set of tasks, or a program designed to carry them out.
backup	Copy information for safekeeping, normally from one disk to another.
baud rate	The rate of information transmission through a serial interface.
BIOS	Basic Input Output System - the interface software between the hardware and the operating system.
bus	A component which carries signals from one part of the computer to another (see also PCI).
cache memory	High speed RAM hardware which speeds up memory operations. Newer models have cache internally in the CPU.
CD-ROM drive	A compact disc providing read only information.
chip	A flake of crystalline silicon (enclosed in a casing with metal pins) on which circuits are engraved to carry, store or process electrical signals representing data within the computer.

CMOS	CMOS memory (Complementary Metal Oxide Semiconductor) stores the system parameters, such as the number and types of disk drives, options for password protection and other special features.
compatibility	The ability of a computer or item of hardware to deal with information or hardware produced for another.
COM1, COM2	Device names used by the system to identify the two serial ports. COM1 is the standard serial port and COM2 is normally used for the mouse.
communication parameters	Baud rate, word length, parity and number of stop bits: settings which must be the same for serial devices sending data to each other.
configuration	The selection of items of equipment used by your computer and the way they are set up for use.
data	Information sent to or received from the computer.
disk	A medium on which programs and data can be magnetically encoded for storage and future use.
disk capacity	The amount of information which can be stored on a disk, expressed in megabytes (MB) or kilobytes (KB).
disk drive	A piece of hardware fitted to your computer which allows programs and data to be transferred between RAM and a disk.
double-density disk	See low-density disk.
drive name	The name used to identify a disk drive or another storage device; for example, the drive name A is used by the operating system to identify the first floppy disk drive.

driver Software which controls a device such as a printer or a mouse.

edge connector The set of connectors engraved along the edge of an adapter card which fits into an expansion slot.

error messages Messages which the computer displays on the screen if the software discovers something wrong when it tries to process a command or program.

Ethernet A commonly used networking standard.

expansion slot Slots designed for add-on cards to be fitted into the computer.

expansion card See adapter card.

file A collection of related information stored on a disk and referred to by a filename.

floppy disk A disk which can store information and which is inserted in a floppy disk drive for use.

format Prepare a disk for use by a particular operating system.

graphics adapter An adapter which enables the computer to display text and graphics on a monitor.

graphics mode A screen mode based on individual pixels rather than complete characters.

hard disk A fixed disk fitted inside a computer; it can store large amounts of information. Sometimes referred to as a "fixed" or "Winchester" disk.

hardware Components which make up the computer and associated devices.

heatsink	A metal construction placed on the processor to dissipate heat from the processor. Sometimes a fan is used instead.
high-density disk	A 3.5 inch floppy disk holding 1.44 MB of information.
IBM-compatible	Capable of using software and components designed for an IBM microcomputer.
industry-standard	The hardware and software most commonly used by IBM-compatible microcomputers.
interface	The means of communication between different pieces of equipment - for example, the circuitry that enables two pieces of equipment such as a computer and a printer to communicate with each other.
ISA	Industry Standard Architecture. A type of bus used as standard, available on all IBM compatible PCs (see bus).
KB	A measure of information (1 KB = 1024 bytes), sometimes written as K, KByte or Kilobyte.
LAN	Local area network; see network.
local bus	A high speed bus connected to the processor to provide improved performance for graphics, hard disk and other adapters.
low-density disk	A 3.5 inch floppy disk holding 720 KB of information.
LPT1	The device name used by the system to identify the parallel printer port.
MB	An amount of information (1 MB = 1024 x 1024 bytes), sometimes written as M, MByte or Megabyte.

mainboard	See system board.
memory	Internal storage of a computer, usually measured in MB or KB; see RAM and ROM.
mode	The way or format in which something works; many RM computers can use IBM Mode or PC-186 Mode, and they all offer a variety of screen modes.
monitor	The component of a computer system on which information is displayed; also known as a Visual Display Unit (VDU), a screen, or a display.
mouse	A desk-based device which can be moved on a flat surface to move a pointer on the screen, with buttons to press to select objects on the screen.
network	A group of computers linked together so as to share devices (such as printers) and information.
operating system	A set of programs that translates commands given directly or through an application so that a computer and devices attached to it can carry them out.
parallel interface	an interface which deals with several signals sent "in parallel" (at the same time).
parity	Usually one "bit" of a byte used to check that the byte has been transmitted and received correctly.
PCI bus	Peripheral Component Interconnect, a type of local bus.
port	A plug, connector, socket or interface.
power supply unit (PSU)	The unit which supplies power to the computer.
program	A complete set of instructions written in a computer language for handling a particular task.

PSU	See power supply unit.
RAM	Random access memory, also known as user or program memory, which stores programs and data loaded from disk ready for processing.
real-time clock (RTC)	A clock inside a computer which keeps time whether the computer is switched on or off.
reboot	See reset.
refresh rate	The number of times per second the graphics adapter sends an image to the monitor.
reset	Clear the memory of a computer and reload the operating system usually done by pressing the reset button.
ROM	Read-only memory. This type of memory can only be read from.
screen mode	The format (including resolution and number of colours) in which information is presented on the screen.
serial interface	An interface which transmits or receives signals one piece at a time.
serial number	The unique number assigned to a computer (or a component); on RM computers, the serial number is on the rear of the computer e.g. M012345678.
server	A computer which controls the activities of a network.
SIMM/DIMM	Single Inline Memory Module/Dual Inline Memory Module; A small plug-in board containing DRAM chips. SIMMs provide your computer's memory.
software	Programs such as operating systems, applications or languages.

standalone	A computer used on its own rather than linked into a network.
stop bit	A serial communications parameter used to make sure that transmitting and receiving equipment are in step with one another.
systemboard	The main printed circuit board inside a computer on which the processor and RAM are attached.
text editor	A program which allows you to create and edit batch files and other text files.
utility	A program used by the operating system to organise and control files, disks and devices.
VGA	A video graphics adapter and standard providing a selection of screen modes.
Windows 3.11	A set of programs which extends the MS-DOS operating system. It provides a graphical user interface (GUI) based on windows, icons, menus and the use of a mouse.
Windows 95 or Windows NT	Newer versions of Windows 3.11 which supports Plug and play and greater security and power management.
word length	Serial communications parameter defining the length of one character of information to be transmitted or received.
write protect	The mechanism provided on a floppy disk to prevent the information on it from being changed.
ZIF	Zero Insertion Force. A type of socket that uses a lever to lock and release the component in the socket.

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